APPENDIX L

Public, Local, Government & Agency Comments

COMMENTS RECEIVED ON THE DRAFT LOWER WEST COAST WATER SUPPLY PLAN

	Organization	Signatory Individual
1.	1000 Friends of Florida	James F. Murley, Executive Director
2.	Collier County Government	Fred Bloetscher, Sr. Project Manager
3.	Collier County Government-Utilities Division	Fred Bloetscher, Asst. Utilities Administrator
4.	Collier Enterprises	Ray March, P.E.
5.	Environmental Confederation of Southwest Florida	Becky Ayech, President
6.	Florida Game and Fresh Water Fish Commission	James W. Beever, III, Biological Scientist III
7.	United State Government	Todd Logan, Florida Panther NWR
8.	Gulf Citrus Growers	Ron Hamel, Executive Vice President
9.	Gulf Utility Company	James W. Moore, President
10.	Henderson, Franklin, Starnes & Holt, P.A.	Russell P. Schropp
11.	The Island Water Association, Inc.	Thomas A. Sharp, President
12.	Lee County Board of County Commissioners	Daryl C. Walk, Acting Director
13.	Lee County Regional Water Supply Authority	Paul Van Buskirk, Executive Director
14.	Lee County Regional Water Supply Authority	Paul Van Buskirk, Executive Director
15.	Lee County Regional Water Supply Authority	Paul Van Buskirk, Executive Director
16.	Lee County Regional Water Supply Authority	Paul Van Buskirk, Executive Director
17.	Lee County Regional Water Supply Authority	Paul Van Buskirk, Executive Director
18.	Lykes Bros., Inc.	P.R. Hamilton
19.	National Audubon Society	Michael Duever, Director of Ecosystem Research Unit
20.	United State Department of the Interior	T.E Miller, Hydrologist
21.	ViroGroup, Missimer Division	Akin Owosina

FRIENDS 1000 FLORIDA

April 23, 1992

Mr. Tilford C. Creel
Executive Director
South Florida Water Management District
3301 Gun Club Road
West Palm Beach, Florida 33406

Dear Mr. Creel:

As you may be aware, 1000 Friends of Florida's efforts include monitoring the activities of the five water management districts that relate to growth management. Therefore, it was with interest that we read about your Water Supply Advisory Committees in the minutes of the March Governing Board meeting. We are particularly interested because of the direct linkages between water demand projections and future land uses.

I would like to request consideration of a member of 1000 Friends of Florida for appointment to the Lower East Coast (LEC), Lower West Coast (LWC) and the to-be-created Dade/Florida Keys Water Supply Plan advisory committees. I would also like to formally request to be added to the mailing list for information disseminated to these committee members.

I look forward to hearing from you. Best regards.

Sincerely,

James F. Murley
Executive Director

JFM/jd

cc: Nathaniel Reed, President, 1000 Friends of Florida
Patricia McKay, Planning Director, 1000 Friends of Florida

1000 FRIENDS OF FLORIDA • POST OFFICE BOX 5948 • TALLAHASSEE, FLORIDA • 32314-5948
(904) 222-6277 • FAX (904) 222-1117 • (800) 277-2926

COLLIER COUNTY GOVERNMENT

PLANNING DEPARTMENT

COUNTY MANAGER'S OFFICE

OFFICE OF CAPITAL PROJECTS MANAGEMENT

3301 E. TAMIAMI TR.
NAPLES, FL 33962
(813) 774-8192
FAX (813) 774-9370

A CERTIFIED BLUE CHIP COMMUNITY

January 5, 1994

Ms. Sharon Trost, Director
Planning Department
South Florida Water Management District
P.O. Box 24680
West Palm Beach, FL 33416-4680

RE: Lower West Coast Water Supply Plan

Dear Ms. Trost:

Per the last meeting of the Lower West Coast Water Supply Committee and my subsequent reading of the draft document, I have several comments regarding the Lower West Coast Water Supply Plan (LWCWSP) as drafted of which need further review. These are as follows:

1. Since its inception, one of the LWCWSP themes has been to push urban users from freshwater sources to saline sources. Long term, this is probably a good idea in order to meet future demands. Collier County recognized the prudence of planning for possible future saline supplies when it designed the new North County Regional Water Treatment Plant, which initially can treat fresh water via membrane softening but can be converted to reverse osmosis in the future, or run in both modes at the same time. Seven years ago, a lime softening plant had been proposed that would need to be discarded if conversion to saline sources occurred. However, most urban users have not had the luxury of Collier County's timing. Many have millions of dollars invested in lime softening facilities and wellfields that are ten to twenty years old and are not near the end of their life expectancy. Forcing these users to abandon freshwater sources would cause their customers to incur drastic increases in user fees. In addition, smaller utilities typically have limitations on borrowing funds or revenue raising, and thus cannot acquire the necessary funds to make these conversions.

2. Over a year ago, the question was raised concerning concentrate disposal from reverse osmosis plants. You will recall a bill in the Florida Legislature in 1990 that would have banned deep injection wells from Tampa to Ft. Myers, including

all of Lee County. FDEP should to be consulted on how disposal can occur if deep wells are banned prior to requiring new urban users to use saline sources. I know of only one utility that does not use deep wells (Venice). They discharge to ponds that leach into an estuary system that goes immediately to the ocean. Utilities that are not on the coast will not be able to economically dispose of millions of gallons of concentrate that will be produced. I also understand that there is some difference of opinion between FDEP representatives and water management district personnel over the use of deep wells, which also needs to be resolved.

3. Reuse is not a panacea to solve all the ills of urban irrigation. It is expensive to install an entire effluent distribution system. There is a drastic disparity between winter flow demands and summer demands, which does not correspond with availability. Collier County has entered into contracts with area golf courses to accept effluent. The contracts specify the daily demand. However, this amount is the average for the year. For example, a typical agreement would be for 500,000 gallons per day. During the wet season, we are lucky to deliver 100,000 gallons per day due to saturation of the course. During the winter, they will take 700,000 gallons or more. The wastewater flows do not fluctuate to this extent. As a result, while Collier County is 100% reuse, only 50 percent goes to golf courses and the rest to percolation ponds. It may be more prudent to contract near the minimum, but the golf courses will obtain SFWMD permits to make up the shortfall during the winter, thereby taxing a resource during its most vulnerable period. For 100 percent reuse to be attainable, a supplemental irrigation source must be developed for the winter months.

4. Aquifer Storage and Recovery (ASR) is a good idea. However, it requires large volumes of water (100 million gallons or more) just to start. This eliminates most smaller utilities because they do not have this kind of avalability. Collier County has a test ASR well on Manatee Road. One hundred ten million gallons have been injected in six cycles over three years. We think we have a successful well and will pursue permitting this winter. However, if the geology is not correct or if transmissivities are too high, ASR may not be feasible even for large utilities.

5. ASR and reuse, as noted in the plan, can be compatible. ASR can supplement reuse systems using surface sources injected during wet periods. However, storage of effluent is not yet attainable under current regulations. This must to be addressed correctly in the plan.

6. Much research needs to be done to more fully understand the needs of the environment and the effect that other land uses may have upon the environment. South Florida's long-term future depends on this balance being met. It is fairly obvious that the balance is not met at present, given apparent long term decreasing rainfall totals, decreasing wildlife populations and lengthening dry seasons. We should all recognize that the natural landscape here had its own balance prior to agriculture or urban users. We also should recognize the economic stimulus that natural areas bring to South Florida, which is often ignored. In 1991, the Everglades/Big Cypress was the number one tourist destination for Europeans. Any economic analysis is likely to significantly underestimate the value of the environment to the south Florida economy.

7. The proposed policy that, in a competing situation, agricultural users always "win" is unacceptable. If there is such a significant problem, who came first? If urban users have had wellfields for years in a certain area, and agriculture moves in (typically by replacing abandoned groves and fields in central Florida), agriculture should be required to re-evaluate their move. Agriculture is a business, and agricultural enterprises must make a business decision on their location based on land costs, labor and water availability. If water is not available, the site simply is not suitable. Urban users must also make these decisions, as most currently do. If a long term plan of an urban user is to draw from a certain area, they usually have existing infrastructure investments, so plans for future resource development should be considered. Agricultural interests should not automatically negate those plans and investments. That could be construed as a "taking."

8. The biggest water "user" in Collier County is the Big Cypress Basin Board that oversees the yearly discharge of 150 billion gallons of water into the Gulf of Mexico. Seven days of that flow supplies the Collier County system for a year, and the City of Naples likewise. The LWCWSP addresses this issue to some extent, but is not specific. We need to determine how this runoff can be reduced or eliminated. Flooding of the south blocks of the Estates is one part of the solution. The flooding may provide additional groundwater recharge for the environment, a positive step, but more thinking needs to go into this approach. While the District has the goal to deal with flooding, it probably needs to become secondary to retaining water. The canals are to alleviate flooding and more water being held back would create additional flooding. The public, however, needs to remember that South Florida is a swamp!! Some balance is needed between environmental needs and agricultural/urban demands.

9. Public education should be an important aspect. Conservation of water is only one portion of the problem. We live in a swamp. We should expect some flooding, high water tables, wildlife, etc. in developed areas. We have degraded the environment with canals because canals effectively drain aquifer levels during the dry season (our studies show the canal levels to match aquifer levels) and prevent full recharge in the wet season. Water that once stood in the Big Cypress Swamp and the Estates now drains off, eliminating the ability of standing water to evaporate and recharge early and late season thunderstorms; hhence, total rainfall decreases. Good public education efforts might build some support for raising weir levels. Higher weir levels may increase surrounding water levels, thereby increasing recharge, but they do not store significantly more water.

10. The plan does not force the urban and agricultural users to see their similarities, thereby breeding competition for water resources. This competition has not traditionally been healthy because the environment suffers, and the true usage is often distorted. Urban users pull water from one area and use it in another, typically in coastal areas subject to saltwater intrusion. In Collier County, most water use goes on lawns or golf courses (in many cases as effluent from wastewater plants). Some is lost via evapo-transpiration. Agricuture users use water in the same vicinity, but they also lose part of it via evapotranspiration. As such, both use water that does not go back into the ground from whence it came. The parties need to work together to see their similarities and each others benefits, and to work toward regional solutions, not separately to meet individual demands. For example, urban use does address coastal saltwater problems, which agriculture does not. The fact that water goes from one spot to aanother is not necessarily bad, unless it causes a negative reaction to that transfer in the environment.

11. As a reality check, the staff and the Board need to keep in mind that the opportunity to make decisions in the best interests of the global spectrum is available because the District Board is not elected. With 5.5 million people in South Florida, and over a million in the LWCWSP area, some of these proposals are going to cost those constituents significant amounts of money, while benefitting the agricultural users. The plan seems oriented to forcing urban users to spend money to find new sources and alternatives so agriculture can use the inexpensive water sources. That balance needs to be

re-examined. Having the environment get the urban water is likley more palatable to the majority of the constituecy than agriculture. Enough exists for all, if only we can retain it, use it, and reuse it wisely.

Overall we have made some progress, but there are remaining issues that must be dealt with prior to creating additional new problems for ourselves, while trying to rectify our current ones.

Should you have any questions, please let me know.

Sincerely,

Fred Bloetscher, PE
Sr. Project Manager

cc: Thomas E. Conrecode, PE, Director OCPM

COLLIER COUNTY GOVERNMENT

UTILITIES DIVISION
WATER AND WASTEWATER SERVICES

3050 NORTH HORSESHOE DRIVE
NAPLES, FL 33942
(813) 434-5050
FAX (813) 434-5039

A CERTIFIED BLUE CHIP COMMUNITY

August 31, 1993

Mr. Dean Powell
Supervising Professional
Upper District Planning Division
Planning Department
South Florida Water Management District
3301 Gun Club Road
P. O. Box 24680
West Palm Beach, FL 33416-4680

Dear Mr. Powell:

Please note the attached package for the O & S information and the Lower West Coast Water Supply Plan Advisory Committee meeting notices were received after the meeting. Mike Slayton advised me that they had occurred and noted that a revised copy of the Lower West Coast Water Supply Plan drought form was provided. I would appreciate it if you would send me any information that I did not receive by not attending the meeting.

Should you have any further questions, please let me know. I appreciate your help and efforts.

Sincerely,

Fred Bloetscher, P.E.
Assistant Utilities Administrator

FB:amk

COLLIER
ENTERPRISES

550 NEW MARKET ROAD, P.O. BOX 738, IMMOKALEE, FL 33934
PHONE 813/657-5133

February 10, 1993

South Florida Water Management District
3301 Gun Club Road
P.O. Box 24680
West Palm Beach, Florida 33406

Attention: Mr. Dean Powell
Supervising Professional
Upper District Planning Division
Planning Department

Subject: Outstanding Natural System Working Group

Dear Dean:

At the Outstanding Natural System Working Group meeting on February 3, 1993, the need for a description of the intended limits of Outstanding Natural System (ONS) boundaries was discussed. Given the proposed large scale of the ONS map, this description is necessary for the map to be appropriately interpreted. It was suggested that members of the working group convey their ideas in this regard to staff prior to the next meeting. Accordingly, my thoughts on this matter are described herein.

The purpose of the ONS map is to identify areas where, because of their ecological value, the District should exercise a higher degree of scrutiny when evaluating the potential impact from water use activities. These potential impacts are anticipated to be predominantly associated with drawdowns beneath wetlands. Upland habitats should be included in the ONS designation where: (1) specific habitat values can be linked to potential drawdown impacts and (2) it can be shown that drawdown limits adequate to protect wetlands will not protect the adjacent uplands (given the gradational nature of well drawdowns). In my opinion, uplands are not significantly threatened by drawdown impacts and, therefore, these criteria will be satisfied very rarely. This is why the Lower West Coast Water Supply Plan is not the appropriate vehicle for upland preservation efforts.

Accordingly, some version of the following statement should appear on the ONS map:

> This map designates the approximate boundaries of natural systems which because of their ecological value should receive a high degree of scrutiny in the evaluation of potential impacts from water use. These boundaries are generally limited to wetlands, due to their sensitivity to hydroperiod changes. Uplands are only intended to be included where specific habitat values can be linked to potential drawdown impacts.

Please call me if you wish to discuss this further. Otherwise, I will see you at the next ONS meeting on February 24, 1993.

Very truly yours,

COLLIER ENTERPRISES

Ray March, P.E.

RM/lg
cc: David Land

ECSWF Environmental Confederation of Southwest Florida

Route 2, Box 341
Sarasota, FL 34234
November 12, 1993

South Florida Water Management District
3301 Gun Club Road
West Palm Beach, FL 33406-4680

Re:District Water Management PlAN
Dear Sir:

Your mission statement includes four important elements, all of which must be met if the quality of life in South Florida and all of the state is to be enhanced. Conservation of water with every means possible and the improvement of water quality free of pollutants are paramount to the health, safety and welfare of the citizens.

There are two items that still bother me. First, the draw down of one foot for thirty days (of wetlands) during a one in ten-year drought situation is not acceptable. The fragile wetlands should not have to pay for careless overuse by the citizens. There should be no drawdown of wetlands allowed, putting them in peril. Alternate sources must be found.

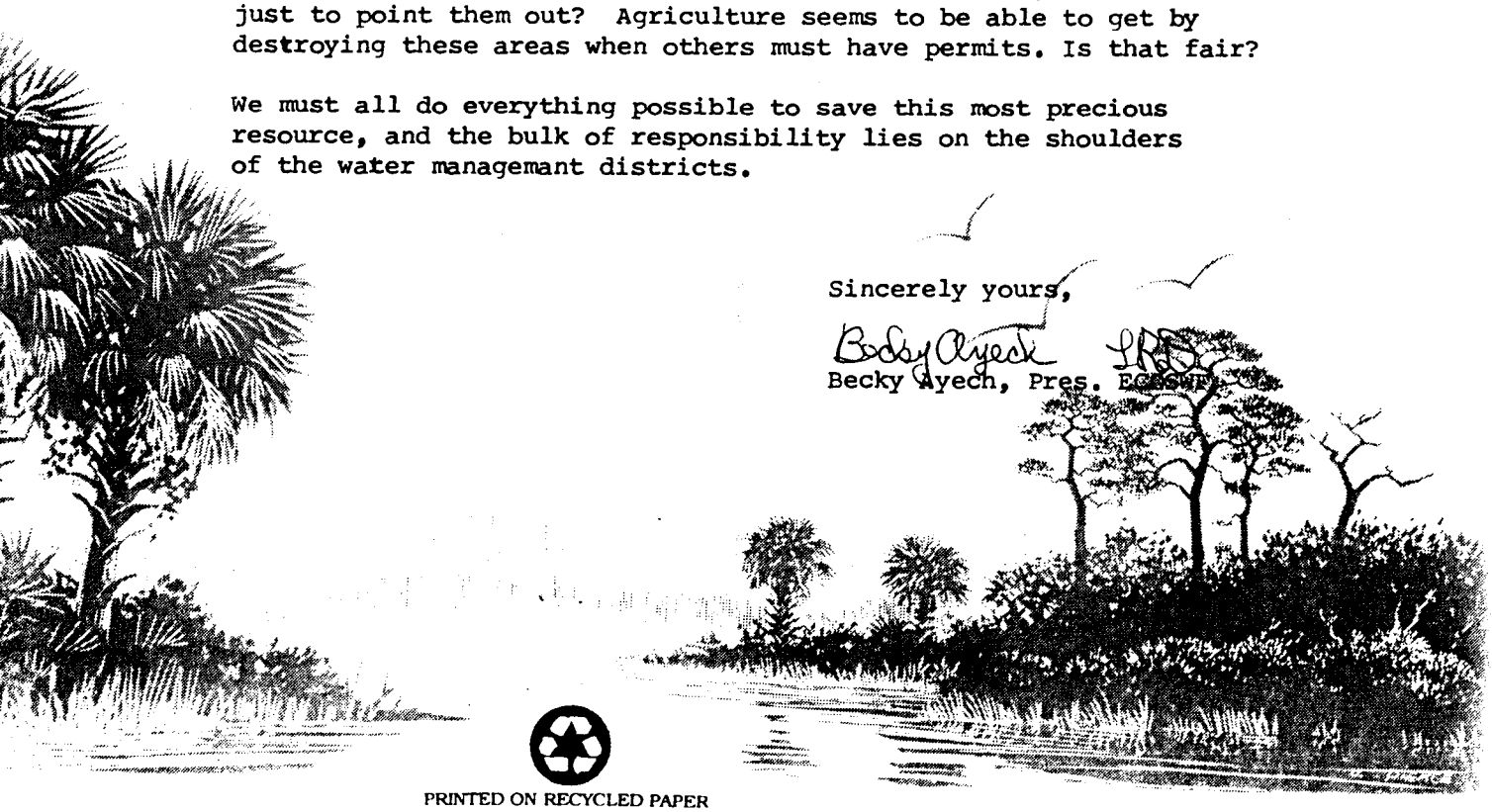
The Outstanding Natural Systems (ONS) map that was prepared took a great deal of time and effort, but the "multiple use" areas need protection, and there must be some enforcement to keep them that way. Nothing was said about enforcement. What good is it just to point them out? Agriculture seems to be able to get by destroying these areas when others must have permits. Is that fair?

We must all do everything possible to save this most precious resource, and the bulk of responsibility lies on the shoulders of the water managemant districts.

Sincerely yours,

Becky Ayech

Becky Ayech, Pres. ECSWF



PRINTED ON RECYCLED PAPER

FLORIDA GAME AND FRESH WATER FISH COMMISSION

Office of Environmental Services
29200 Tuckers Grade
Punta Gorda, Florida 33955

February 8, 1993

Ms. Sharon Frost
South Florida Water Management District
Resource Control Department
3301 Gun Club Road
P.O. Box 24680
West Palm Beach, Florida 33416-4680

RE: ONS Meeting Notice, Intended Use of CREW Purchase Area

Dear Ms. Frost:

I am writing this letter to address two matters. First, I did not receive notice of the January meeting of the ONS committee and I did not receive notice of the February 3, 1993 meeting until the afternoon of the February 3, 1993, meeting of the ONS. In order to be able to attend ONS meetings, I need at least one week notice.

Also, please note that when the CARL committee designated those areas of the CREW that were to be purchased by CARL monies, the intent and purpose of the purchase was explicitly stated. I enclose the CREW listing from the 1992 CARL book. This is material I provided SFWMD staff in previous meetings for distribution to the committee. Thank you for your consideration.

Sincerely,

James W. Beever III

James W. Beever III
Biological Scientist III

JWB3/lav
ENV 2-1-1/5
Enclsoure
onsfrost.sfm

#52 CORKSCREW REGIONAL ECOSYSTEM WATERSHED		COLLIER/LEE COUNTIES	
Acreage		Value	
Acquired	Remaining	Funds Expended or Encumbered	Remaining Tax Value
-0-*	18,205	-0-*	$23,704,330

* See "Coordination".

LOCATION
In Collier County south of Lake Trafford and the City of Immokalee. On the southern border the project connects with the Florida Panther National Wildlife Refuge.

RESOURCE DESCRIPTION
The project would connect the Florida Panther National Wildlife Refuge and Fakahatchee Strand State Preserve with the National Audubon Society's Corkscrew Swamp Sanctuary, and secure important habitat for the Florida panther, Florida black bear, and wood stork. These large, contiguous expanses of

Highest Ranked FNAI-listed Elements

Name	FNAI Rank
Florida panther	G4T1/S1
Florida black bear	G5T2/S2
Round-tailed muskrat	G3/S3
Swale	G4?/S3
Dome Swamp	G4?/S3?
Slough	G4/S4?
Mesic Flatwoods	G?/S4
Strand Swamp	G4?/S4?
Wet Flatwoods	G?/S4?
Wood stork	G5/S2
14 FNAI elements known from site	

South Florida wetlands are believed to be critical to the continued survival of these critically-imperilled, wide-ranging species. The acquisition project supports populations of at least two species of rare and endangered orchids, and includes an unusual stand of dwarf bald cypress.

No archeological/historical sites within the boundaries of this project are recorded within the Florida Master Site File. When compared to other projects, the potential for significant sites is considered to be moderate.

The project could accommodate hiking, bicycling, camping, and horseback riding as well as provide opportunities for education.

RECOMMENDED PUBLIC PURPOSE
Qualifies for State acquisition under the "Environmentally Endangered Lands (EEL)" category, as defined in Section 18-8.003 of the Florida Administrative Code. Public acquisition would protect lands connecting the Corkscrew Swamp Sanctuary, the Florida Panther National Wildlife Refuge, and the Fakahatchee Strand State Preserve, and create a corridor of uninterrupted protected lands within active Florida panther range. Acquisition would also protect significant populations of Florida black bears, wood storks, and rare orchids.

MANAGER
South Florida Water Management District with Game and Fresh Water Fish Commission, Lee County, National Audubon Society, and Collier County cooperating.

PROPOSED USE
Water Conservation Area, Wildlife Management Area, and County Park.

MANAGEMENT CONCEPTS
The project would be managed by the South Florida Water Management District with Game and Fresh Water Fish Commission, Lee County, National Audubon Society, and Collier County cooperating. It would be managed under multiple use concepts with special attention given to maintaining and enhancing Florida panther populations and hydrological

MANAGEMENT COSTS

Estimated start-up cost for South Florida Water Management District

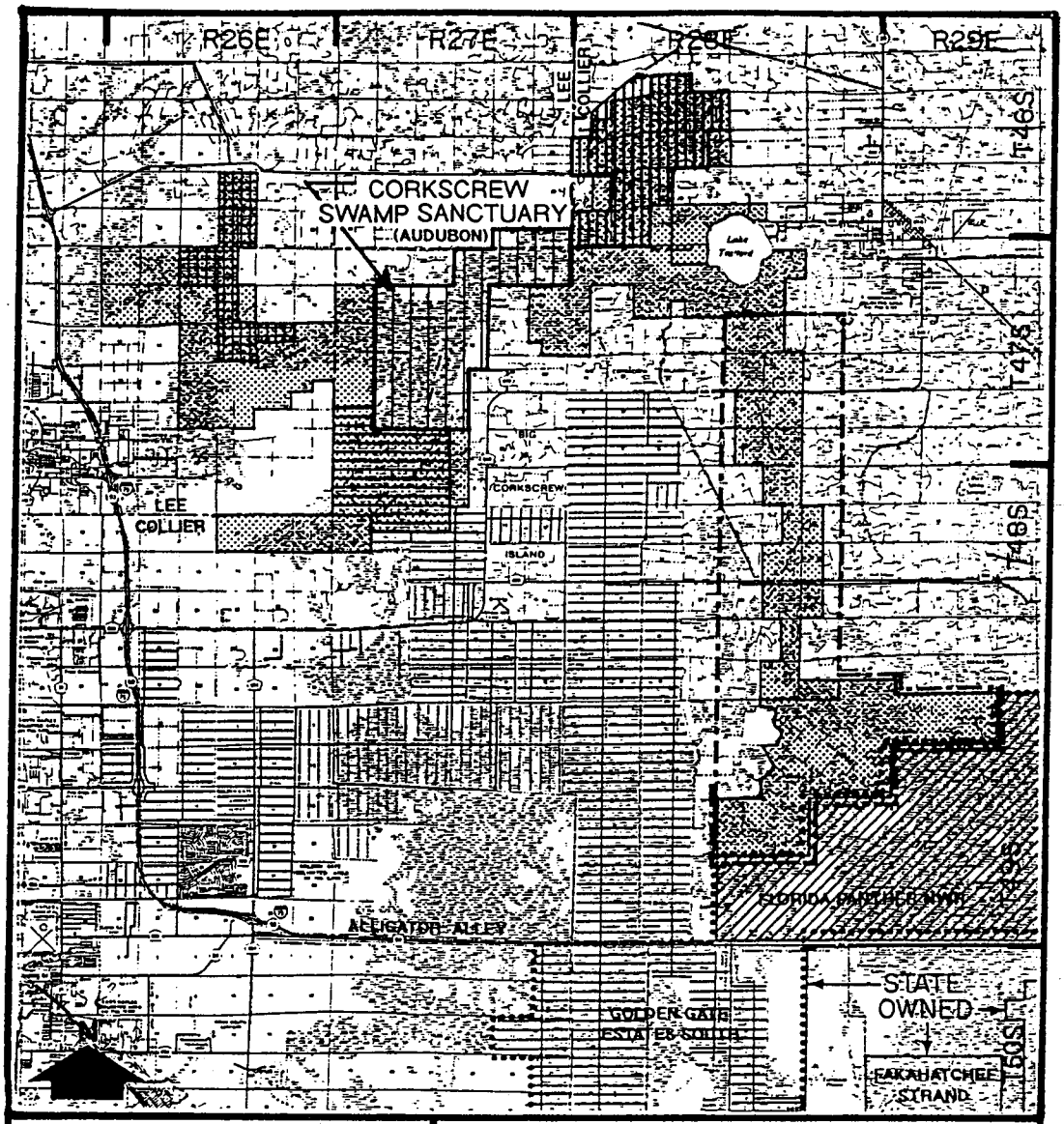
Salary	OPS	Expense	OCO	FCO	Total
$15,000	$2,000	$210,000	$5,000	$10,000	$242,000

Source of Funding: Water Management Lands Trust Fund (Save Our Rivers)

Estimated start-up costs for Lee County

Salary	OPS	Expense	OCO	FCO	Total
$25,765	-0-	$2,000	-0-	-0-	$27,765

Source of Funding: Lee County

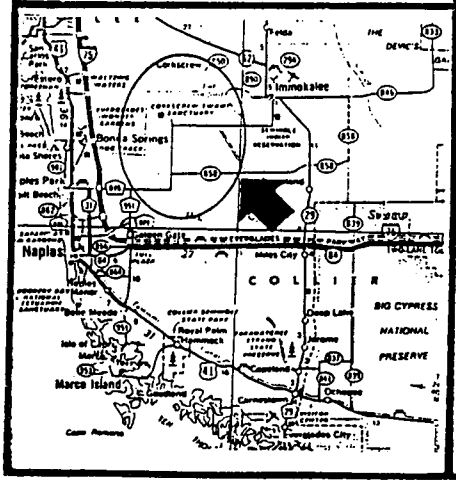


0 1 2
MILES

CORKSCREW REGIONAL ECOSYSTEM WATERSHED

(C.R.E.W.)

COLLIER/LEE COUNTIES



- PROJECT AREA
- CARL TARGETED AREA
- SFWMD PURCHASED
- TPL/LEE CO. PURCHASED OR UNDER OPTION
- TNC/COLLIER CO. PURCHASED OR UNDER OPTION
- CORKSCREW SWAMP SANCTUARY (AUDUBON)
- PANTHER NATIONAL WILDLIFE REFUGE
- SAVE OUR EVERGLADES CARL

resources. Emphasis would also be placed on protection of other rare or sensitive biological resources. The project would be divided into several units for management purposes. One unit will be managed by the Florida Game and Fresh Water Fish Commission as a Wildlife Management Area; another unit will be managed as a park with limited recreational development such as primitive camping and environmental education; and at least one unit will be managed by the South Florida Water Management District as a Water Conservation Area or Preserve.

VULNERABILITY AND ENDANGERMENT

The vast majority of the project consists of wetland swamps and marshes unsuitable for residential development. However, this region is traditionally used for agriculture, and much of it has already been drained, ditched and developed for row crops. Some of the area surrounding the project has been converted to citrus groves.

This is a growth center in Florida, so there is a threat of residential development in the upland areas of the project. The portion of the project in Collier County is identified on the Future Land Use Map of the adopted comprehensive plan as Agricultural/ Residential, with a maximum density of one unit per five acres. The wetland areas of the site are designated Areas of Environmental Concern, and a majority of the site is indicated as lands to be acquired for conservation. The portion in Lee County is designated on the Future Land Use Map as Open Land, with allowable residential densities of one unit per acre, interspersed with Environmentally Critical Areas where densities are not to exceed one unit per 40 acres.

A portion of the project in Collier County is in the Big Cypress Area of Critical State Concern.

ACQUISITION PLANNING

On December 7, 1990, the Land Acquisition Advisory Council (LAAC) approved the project design with the acknowledgement that the CARL program's primary focus would be on acquiring easements and ownerships in the Camp Kelas Strand area connecting the project with the Florida Panther National Wildlife Refuge and Fakahatchee Strand. Special emphasis will be placed on providing suitable upland buffer to complement the existing wetland corridor. If fee-simple acquisition is not negotiable, then conservation easements or other less-than-fee-acquisition techniques will be pursued.

Coordination

The entire project in both Lee and Collier Counties consists of approximately 49,810 acres. South Florida Water Management District has acquired 6,800 acres in Corkscrew Marsh, which connects with Audubon's Corkscrew Swamp Sanctuary. Both Lee and Collier Counties are participating in the purchase of land within the project area. Lee County, in conjunction with the Trust for Public Lands is negotiating purchases and now owns 4,650 acres and has 150 under contract in Flint Pen Strand. The Nature Conservancy has been negotiating approximately 8,000 acres in Collier County, Bird Rookery Swamp. State, federal and local governments will be planning and work together to bring this project under public management.

OWNERSHIP

This project consists of 18,205 acres and 73 owners. The largest owner is the Collier family.

ACQUISITION STATUS

Due to its low ranking and limited CARL funds, negotiations have not been initiated on this project.

RESOLUTIONS

Number	Submitting Agency	Issues or Comments
—	Lee County Commission	Pledging $1.5 Million

Shan Trost

OPTIONAL FORM NO. 10
5010-109

UNITED STATES GOVERNMENT

Memorandum

TO : Valerie Boyd, Chair
LWC Water Supply Plan Advisory Committee

DATE: Sept. 8, 1992

FROM : Todd Logan, Florida Panther NWR

SUBJECT: LWC Water Supply Plan Mailing List

Could you drop me from the LWC Water Supply Plan mailing list? Our agency is interested in the plan, but Peter Plage has been designated as our agency contact/participant. He is also receiving the mailings. Thanks.

Todd Logan

Gulf Citrus Growers Assn. Inc.

cc: Jim G. & David G-H

Ron Hamel
Executive Vice President
and
General Manager

Recd 6/7/93

June 3, 1993

Mr. Terry Clark
SWFMD
P. O. Box 24680
West Palm Beach, FL 33416

Dear Mr. Clark:

Attached, please find the most current projections for citrus development in the "Gulf" citrus production area. This includes Charlotte, Collier, Glades, Hendry and Lee counties.

As you will note, these projections greatly reduce the rate of growth experienced in this area during the past decade. And, this should reduce the pressures on our water resources within the lower west coast area.

If we can be of additional service, please let us know.

Sincerely,

Ron Hamel
Executive Vice President
General Manager

RH/cfh

encl.

cc: Board of Directors
Ed English, Tom Jones, Glenn Simpson

P.O. Box 1319, LaBelle, Florida 33935, 813/675-2180 / Fax 813/675-8087

cc: Jim G. & David G.

STATE OF FLORIDA
DEPARTMENT OF CITRUS

ECONOMIC RESEARCH DEPARTMENT
2129 McCARTY HALL/P.O. BOX 110240
UNIVERSITY OF FLORIDA
GAINESVILLE, FLORIDA 32611-0240

Telephone: 904/392-1874 FAX: 904/392-8634

AGENCY HEAD
FLORIDA CITRUS COMMISSION
HUGH M. ENGLISH, Chairman

INTERIM EXECUTIVE DIRECTOR
MICHAEL W. SPARKS
Phone: (813) 499-2500
FAX: (813) 499-2374

May 13, 1993

Recd 6/7/93

Ron Hamel
Gulf Citrus Growers Association, Inc.
250 Lee Street
P. O. Box 1319
LaBelle FL 33935

Dear Mr. Hamel:

Please find enclosed a report on Gulf citrus acreage and trees, which Bob Behr asked me to do for you. Acreage and tree projections are made for the 1992-93 to 2009-10 seasons.

If you have any questions regarding the projections, I would be glad to try to answer them.

Sincerely,

Mark G. Brown
Research Economist

MGB/dk
Enclosure

Gulf Citrus Acreage and Tree Projections 1992-93 Through 2009-10*

The Gulf citrus region includes five counties—Charlotte, Collier, Glades, Hendry and Lee. According to the Florida Agricultural Statistics Service's (FASS) "Commercial Citrus Inventory 1992," total citrus acreage in the Gulf region in 1992 was 157,239, representing 19.9% of Florida's total citrus acreage of 791,290. The number of citrus trees in the Gulf region in 1992 was 22.2 million, representing 24.2% of Florida's citrus tree population of 92.0 million.

Projections of acres and trees were made by applying assumed loss and planting rates to the 1992 acreage and tree levels reported by FASS. The loss and planting assumptions are based on historic rates implied by changes in the commercial citrus inventory over time. Over the last ten years, loss rates have been declining somewhat in the Gulf region. Comparison of the 1990 and 1992 commercial tree inventories indicates that the tree loss rate was about 1.6%. The 1.6% tree loss rate was assumed over the projection period. Acreage projections were based on the tree projections.

The average annual tree planting level in the Gulf region over 1989 through 1991 was roughly 3.1 million trees. For the projection period, tree planting levels were assumed to be one half the 1989-1991 average for 1992-93 and 1993-94 and one quarter the average thereafter. The assumed decline in plantings follows the same assumed trend for Florida plantings reported in "Florida Citrus Production Trends, 1993-94 Through 2002-03," Florida Department of Citrus, Economic and Market Research Department. The assumed reductions in plantings are based on the expectation that supply will tend to grow faster than demand in the upcoming years, putting downward pressure on prices and providing less incentive to plant.

---

*Prepared by Mark G. Brown, Research Economist, Florida Department of Citrus, May 7, 1993.

Table 1 shows that Gulf citrus acreage could grow to 201.5 thousand acres by 2009-10, 28.2% greater than the 1992 level of 157.2 thousand acres. The Gulf citrus tree population could grow to 30.1 million trees by 2009-10, 35.6% greater than the 1992 level of 22.2 million trees.

Table 1. Gulf region[a] citrus acreage and tree population projections, 1992-93 through 2009-10.

Season	Acres	Trees
	thousands	millions
1991-92	157.2	22.2
1992-93	164.4	23.4
1993-94	171.5	24.6
1994-95	173.6	25.0
1995-96	175.7	25.4
1996-97	177.8	25.7
1997-98	179.8	26.1
1998-99	181.7	26.5
1999-2000	183.7	26.8
2000-01	185.6	27.2
2001-02	187.5	27.5
2002-03	189.4	27.8
2003-04	191.2	28.2
2004-05	193.0	28.5
2005-06	194.7	28.8
2006-07	196.5	29.1
2007-08	198.2	29.5
2008-09	199.9	29.8
2009-10	201.5	30.1

[a] Charlotte, Collier, Glades, Hendry and Lee counties.

Gulf Utility Company
P.O. Box 350
Estero, FL 33928-0350
18513 Bartow Blvd. S.E.
Ft. Myers, FL 33912
813/267-1000

Terry Pls File w/ LCWA corres. I left a message

November 19, 1992

Ms. Sharon M. Trost, Director
Upper District Planning Division
South Florida Water Management
District
P.O. Box 24680
West Palm Beach, FL 33416-4680

Re: Lower West Coast Water Supply Plan - Revised Modeling

Dear Sharon:

The central concern of all water users is planning for adequate supply to meet their projected demands - through 2010 and beyond.

At last week's meeting of the Lee County Regional Water Supply Authority, Missimer & Associates made a presentation which concluded that, based on the modeling parameters proposed by the District, future withdrawals from the water table aquifer would be effectively eliminated. Missimer went on to report that the very limited existing data available indicated that alternative supplies - i.e., the deeper aquifers - were inadequate to either replace current sources of supply or meet future demand in Lee County.

Given these facts, I hope those responsible at the District will see to it that the "revised" model is a practical and usable one. If withdrawals are to be limited in the water table aquifer, which aquifer will future withdrawals come from, and are there adequate quantities in that aquifer to meet future demand?

It will serve no purpose to effectively limit future sources of supply without providing reasonable alternatives - and reasonable prospects of these future sources being permitted for withdrawal.

Thank you for all your hard work in this project to date, and your efforts to address the complex concerns raised by all the constituencies involved in this process.

Sincerely,

James W. Moore
President

cc: Valerie Boyd

JWM/kb

HENDERSON, FRANKLIN, STARNES & HOLT, P.A.

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RANDAL H. THOMAS
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1715 MONROE STREET
POST OFFICE BOX 280
FORT MYERS, FLORIDA 33902-0280
(813) 334-4121
FACSIMILE (813) 332-4494

Writer's Direct Dial Number (813) 337-8414

April 3, 1992

Ms. Sharon Trost
South Florida Water Management District
3301 Gun Club Road
Post Office Box 24680
West Palm Beach FL 33416-4680

RE: LOWER WEST COAST WATER SUPPLY PLAN

Dear Sharon:

Thank you for returning my phone call on April 2, 1992. Unfortunately, I was out of the office, and rather than try to catch you by telephone, I thought it would be easier to write this short letter.

It appears that it will not be necessary to take your deposition regarding the Water Supply Plan, as we discussed last week. I do appreciate your taking the time to discuss the Plan with me at the meeting.

Thanks again.

Sincerely,

Russell P. Schropp

/jlf

2/8/93 RES 16-14

Original in Executive Office

c: Terry Clark, Trost, Dempsey

THE ISLAND WATER ASSOCIATION, INC.

February 5, 1993

Mr. Thomas K. MacVicar
Deputy Executive Director
South Florida Water Management District
P.O. Box 24680
West Palm Beach, FL 33416-4680

Dear Mr. MacVicar:

Thank you for your response to my letter of December 19, 1992 regarding inter-district transfer of water. It was reassuring to the Board of Directors of The Island Water Association that Chapter 373 of the Florida Statutes should not prohibit such interchange.

This issue was addressed on our part since it could affect the availability of Sanibel-Captiva water supplies in the future.

Our technical staff is anxious to participate in the preparation of the Lower West Coast Regional Water Supply Plan. Richard Derowitsch, our Engineering Supervisor, will be in touch with your Terry Clark soon.

Sincerely,

THE ISLAND WATER ASSOCIATION, INC.

Thomas A. Sharp

THOMAS A. SHARP, President
Board of Directors

cc: Senator Fred Dudley
Representative Tim Ireland

POST OFFICE BOX 509 • SANIBEL, FLORIDA 33957-0509 • PHONE (813) 472-1502 • FAX (813) 472-1505

COUNTY

BOARD OF COUNTY COMMISSIONERS

P.O. Box 398
Fort Myers, Florida 33902-0398
(813) 335-2111

335-2830

Author's Direct Dial Number

PL-022-92

March 26, 1992

3/30/92 RES 16-14

Orig. in EXO

c: Harvey, Trost, Pearson

Tilford Creel, Executive Director
SOUTH FLORIDA WATER MANAGEMENT DISTRIC
3301 Gun Club Road
West Palm Beach, FL 33416-2045

RE: REVIEW OF DRAFT LOWER WEST COAST WATER SUPPLY PLAN

Dear Mr. Creel:

The Department of Lee County Utilities has reviewed the draft report entitled, "Lower West Coast Water Supply Plan," dated January, 1992, as prepared by the South Florida Water Management District Planning Department staff. The intent of this letter is to provide our input and actions regarding the proposed Plan.

The Lower West Coast Water Supply Plan identifies five water supply problems within Lee County, including potential environmental impacts resulting from water level declines in the Corkscrew Wellfield. It is indicated that no drawdown, versus the current one foot drawdown of the water table aquifer, will be allowed beneath wetlands and other sensitive areas. The Plan recommends that future raw water supply from the Corkscrew Wellfield be obtained from the Floridan Aquifer System due to the expected impact on large and small wetland systems from current surficial aquifer pumpage.

Lee County Utilities sincerely supports the conservation of wetlands, as described in the Lower West Coast Water Supply Plan. However, the definition of wetland impact and the relationship to wellfield drawdown, as determined by regional and local groundwater flow modeling, should be better defined. We are concerned that the Plan's recommendations will result in significant economic burdens on Lee County Utilities' customers. The Plan should address assessing environmental impacts and cost/benefit analyses on a site-by-site basis.

In addition, we think that other alternatives, such as wetland monitoring to verify actual ecological impacts and wetland mitigation, which has been accepted in many other areas of Florida as wetland protection, should be considered in the Lower West Coast Water Supply Plan to protect the local environment.

Lee County is ready to work with SFWMD in developing an effective and implementable water supply plan. If you have any questions, please contact me.

Sincerely,

Daryl C. Walk

Daryl C. Walk, P.E.
Acting Director
DEPARTMENT OF LEE COUNTY UTILITIES

DCW/lmm
001302

cc: Commissioner St. Cerny
Commissioner Lopez-Wolfe
Commissioner Judah
Commissioner Manning
Commissioner Slisher
Julio Avael, County Administrator
Karen B. Hawes, Deputy County Administrator

Lee County Regional Water Supply Authority

1617 Hendry Street, #310, Fort Myers, FL 33901

Paul Van Buskirk, P.E., A.I.C.P.
Executive Director

Tel.: (813) 332-5819
Fax.: (813) 332-5819

Rec'd 12/29/93 pc

December 16, 1993

Mr. Terry A. Clark, AICP
Director
Upper District Planning
South Florida Water Management District
Post Office Box 24680
West Palm Beach FL 33416-4680

Dear Terry:

This letter accompanies a copy of the Lee County Regional Water Supply Authority's Draft Water Supply Master Plan 1993-2030, Volumes I - II, and Appendices A, B, & C for your review.

Please call with any questions or comments you and your staff may have. I look forward to hearing from you.

Sincerely,

Paul Van Buskirk, P.E., AICP
Executive Director

LT11093E

Lee County Regional Water Supply Authority

1617 Hendry Street, #310, Fort Myers, FL 33901

Paul Van Buskirk, P.E., A.I.C.P.
Executive Director

Tel.: (813) 332-5819
Fax.: (813) 332-5819

Recd 11/15/93

M E M O R A N D U M

TO: Terry Clark, AICP
Director, Upper District Planning
South Florida Water Management District

FROM: Paul Van Buskirk, P.E., AICP
Executive Director

DATE: November 10, 1993

RE: Draft Lower West Coast Water Supply Plan-Oct. 1993

On page 44, the last sentence reads:

"All recommendations in the RWSA plan must be found consistent with this plan...."

This sounds somewhat dictatorial. We want to cooperate, however, do it our way.

We may come up with better solutions or approaches. I would recommend the following language:

"The RWSA plan was developed using similar modeling methods, resource criteria and guidelines so that it would be consistent with this plan. Appropriate permits shall be obtained prior to plan implementation."

PVB

MM04993E

Lee County Regional Water Supply Authority

1617 Hendry Street, #310, Fort Myers, FL 33901

Paul Van Buskirk, P.E., A.I.C.P.
Executive Director

Tel.: (813) 332-5819
Fax.: (813) 332-5819

November 3, 1993

Mr. Terry A. Clark, AICP
Director, Upper District Planning
South Florida Water Management District
Post Office Box 24680
West Palm Beach FL 33416-4680

Dear Terry:

Enclosed are two copies of the Lee County Regional Water Supply Authority's Master Plan Briefing Document for your review. This document was presented to the Authority's Board on October 28, 1993.

The plan will be available on November 18. The technical appendices will be available on December 16.

Please call me with your comments. I look forward to hearing from you.

Sincerely,

Paul Van Buskirk, P.E., AICP
Executive Director

Enclosure

LT09293E

Lee County Regional Water Supply Authority

1617 Handry Street, #310, Fort Myers, FL 33901

Paul Van Buskirk, P.E., A.I.C.P.
Executive Director

Tel.: (813) 332-5819
Fax : (813) 332-5819

June 3, 1993

Mr. Terry Clark, A.I.C.P.
Senior Planner, Planning Department
South Florida Water Management District
Post Office Box 24680
West Palm Beach FL 33416-4680

RE: Lee County Regional Water Supply Authority (LCRWSA)
Water Supply Master Plan
Datasets for Well Withdrawals

Dear Terry:

I am sure it is our mutual desire that the groundwater modeling efforts done for the Lee County portion of SFWMD's lower west coast plan and the LCRWSA 40-year water supply master plan be as similar as possible with respect to the aquifer hydraulic parameters input data, the calibrated base year (1990) solution, and the projected groundwater withdrawals. To that end, I would appreciate it if you would provide the LCRWSA the disaggregated data sets for projected well withdrawals for all users (domestic self-supplied, golf courses, commercial and industrial, utilities, and agricultural). We have projections of water demands by utilities that we plan to use for the model runs.

I understand that your projected water use for agricultural users is being re-evaluated so that it is not currently available. Could you please provide all well withdrawal package datasets which are available at this time, and then send the agricultural withdrawals when they are available. Groundwater model runs, for the future scenarios for the LCRWSA master plan, are scheduled to begin during the week of June 14, so you prompt reply will be appreciated.

Have you completed your evaluation of the calibrated MODFLOW model of the Lee County prepared by ViroGroup, Missimer Division

LT05393E
1/2

LT05393E
6/3/93
2/2

for the LCRWSA master plan? I forwarded the model diskettes and draft documentation to you (through Chip Morriam) on April 23, 1993. If you or your staff have any questions you would like us to address, please notify me.

Sincerely,

Paul Van Buskirk, P.E., A.I.C.P.
Executive Director

c: C. Merriam, SFWMD
M.J. Shine, SFWMD
S.J. Calise, CDM
R.A. Dickinson, CDM
W.K. Martin, M&A

cc: Sharon T.

Lee County Regional Water Supply Authority

1617 Hendry Street, #310, Fort Myers, FL 33901

Paul Van Buskirk, P.E., A.I.C.P.
Executive Director

Tel.: (813) 332-5819
Fax.: (813) 332-5819

April 14, 1993

Mr. Terry A. Clark, A.I.C.P.
Senior Planner
South Florida Water Management District
Post Office Box 24680
West Palm Beach FL 33416-4680

Dear Terry:

Due to a reorganization within the Lee County Board of County Commissioners, there has been a change in your representative for the Lower West Coast Water Supply Plan. Commissioner John Albion has taken over for Commissioner John Manning regarding this issue. Please forward all correspondence to:

Commissioner John E. Albion
Lee County Board of County Commissioners
Post Office Box 398
Fort Myers FL 33902-0398

You may also note that Commissioner Albion has joined the Authority's Board as a representative for Lee County.

Please call me if I may be of any further assistance. I look forward to seeing you soon.

Sincerely,

Paul Van Buskirk, P.E., A.I.C.P.
Executive Director

LT03493E

LYKES BROS. INC.
Agriculture Group
7 LYKES ROAD
LAKE PLACID, FL 33852
TELEPHONE: (813) 465-4127
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LYKES CITRUS MANAGEMENT DIVISION
7 Lykes Road
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LYKES SOUTHERN OPERATING DIVISION
106 S.W. C.R. 721
Okeechobee, FL 34974-8918
Telephone: (813) 763-3041
(813) 763-3545
FAX: (813) 467-4951

October 5, 1993

Ms. Sharon Trost, Planning Director
South Florida Water Management District
P. O. Box 24680
West Palm Beach, FL 33416-4680

Re: ONS Mapping

Dear Ms. Trost:

At a March 11, 1993 meeting between WMD Staff and the Save Our Creek group (held as an adjunct to the LWCWSPAC meeting), Sonny Williamson asked when the ONS map would be ready. David Thatcher (WMD Staff) indicated that the draft map showing possible ONS designations was approximately 2 months from completion. He further indicated that owner representatives would be involved in the process and that an area would not be designated ONS without the consent of the owner.

At this date there is now a draft ONS map being circulated which appears to designate all of Lykes Glades County property within the LWCWSPA as ONS. Contrary to Mr. Thatcher's representation, we have not been consulted nor have we consented to this designation.

In following up on this oversight, one of my staff attended a meeting in Naples 09/14/93. At that meeting, Mr. Terry Clark (WMD Staff) and 3 other staff persons were asked to provide the criteria and methodology by which sites were evaluated for ONS inclusion or exclusion. The indication was that no written documentation for that process existed.

It is impossible for us to even speculate as to what rationale was used to include Lykes property since the mapping covers large areas of the following:

1. Intensive Silviculture - Eucalyptus
2. Intensive Silviculture - Pine
3. Intensively managed improved pastures
4. Intensively farmed row crops
5. Heavily managed semi-improved and rangeland pastures
6. Heavily managed water control programs (Grandfathered)
7. WMD Permitted Surface Water Management Plans

In short there are few if any areas that would qualify as pristine, largely natural or not dominated by man-managed agricultural activities.

We can only speculate, but it would appear that the only real reason for including Lykes' property is that it represents a large block of land in one ownership, or that Lykes' intensively managed agricultural operations have been so beneficial to environmental values that we can expect a resolution of the Governing Board asking us to do more of the same.

On the basis of the foregoing, we would like to indicate to the SFWMD in the strongest possible terms:

1. We have not, do not and will not consent to the inclusion of Lykes properties as ONS in this or any other mapping effort.

2. There is no rational, defensible criteria and methodology for evaluating lands for inclusion in, or exclusion from, any such mapping effort and hence any product of such an effort is fatally flawed.

3. The total absence of credibility of this effort indicates that it should be abandoned since bad data are worse than no data at all.

We would be pleased to hear from you further in this regard.

Sincerely,

P.R. Hamilton

xc: B. Blain
S. Williamson

National Audubon Society

ECOSYSTEM RESEARCH UNIT, BOX 1877, RT. 6, SANCTUARY RD. NAPLES, FLORIDA 33964 (813) 657-2531

3 April 1992

Valerie Boyd
Board Member, SFWMD
1442 Galleon Drive
Naples, FL 33940

Dear Ms. Boyd,

I have been conducting research on the ecology of natural ecosystems in southwest Florida for over 18 years, and as a result have developed something of an expertise on the area. The main focus of my work has been the relationship between hydrology, soils, and plant communities as they operate under natural conditions and how they can be affected by man's activities.

I attended the last meeting of the LWCWSP Advisory Committee in Ft. Myers, because several people felt I might be able to make a useful contribution to discussions of the plan. I realize the size of the advisory committee is already rather large, but if it were possible, I would like to be considered for membership on the advisory committee. I think that some of the information our research group has collected over the years, some of which is not generally available, may be quite helpful in future discussions.

Sincerely,

Michael Duever, Ph.D.
Director

cc. Sharon Trost
Terry Clark

United States Department of the Interior
NATIONAL PARK SERVICE
BIG CYPRESS NATIONAL PRESERVE
S. R. BOX 110
OCHOPEE, FLORIDA 33943

TAKE PRIDE IN AMERICA

IN REPLY REFER TO:

David R. Swift
Planning Department
South Florida Water Management District
PO Box 24680, 3301 Gun Club Road
West Palm Beach, Florida 33416-4680
July 2, 1993

Dear David,

Enclosed are brief discussions of the some of the issues of greatest concern to Big Cypress National Preserve, as per Sharon Trost's request of May 18.

Our primary interest is in ensuring that Big Cypress National Preserve needs are considered in the water budget of the Lower East Coast Water Supply Plan. As detailed somewhat more in the accompanying document, at least 50% of the total Big Cypress-Everglades flow across the Tamiami Trail originates in Big Cypress National Preserve prior to entering either the marshes of the Everglades, or the estuarine environment of the Ten Thousand Islands. This enormous freshwater influx (>500,000 acre-feet/year) from the Preserve has, far-ranging effects far beyond the Ten Thousand Islands: *its movement down the coast critically influences Florida Bay.*

In South Florida, natural hydrologic catchments do not neatly coincide with agency jurisdictional boundaries. It is important to assure to the Big Cypress Swamp proper allocations of that share of the regional water supply necessary to support the long-term viability both of the Big Cypress National Preserve natural ecosystem, and the distant environments dependent upon it.

Sincerely,

T.E. Miller, Ph.D.
Hydrologist
Big Cypress National Preserve
HCR 61, Box 110
Ochopee, Florida 33943

813 695-2000 Ext. 44
695-3007 FAX

HYDROLOGIC ENVIRONMENTAL ISSUES at BIG CYPRESS NATIONAL PRESERVE

INTRODUCTION

Big Cypress National Preserve was created to protect and manage its internal resources, as well as the quality and quantity of water flowing to the Ten Thousand Islands area of Everglades National Park. Agency jurisdictional boundaries that do not coincide with natural hydrologic catchments have inhibited proper allocations of that share of the regional water supply necessary to support the long-term viability of the Big Cypress National Preserve natural ecosystem.

Modelling of regional and local hydrologic regimes has been begun by the South Florida Water Management District (SFWMD) both east and west of Big Cypress National Preserve, yet the 716,000 acres of the Preserve have not been included.

This is a significant omission: long-term discharge means [determined from 28-52 years of data] measured by the US Geological Survey demonstrate that at least 50% of the total Big Cypress-Everglades flow across the Tamiami Trail (from the Barron River Canal to WMD Levee 30) has originated in Big Cypress National Preserve prior to entering either the marshes of the Everglades, or the estuarine environment of the Ten Thousand Islands [USGS 1992, pp. 110, 113, 124, 125, 149].

This enormous freshwater influx (>500,000 acre-feet/year) from Big Cypress National Preserve has far-ranging effects far beyond the Ten Thousand Islands: *its movement down the coast is of critical influence to Florida Bay* (Fourqurean et al., 1993; Porter and Meier, 1992; and Smith et al. 1989).

The hydrologic issues of greatest environmental concern to Big Cypress National Preserve, those that can be most influenced by consideration in SFWMD planning, can be grouped in the following:

I. BASELINE HYDROLOGY CHARACTERIZATION: CLIMATE, WATER BUDGET, FLOW ROUTES AND WATER QUALITY

II. GROUNDWATER DISCHARGE and QUALITY, and SUBSURFACE GEOLOGY

III. ANALYSIS OF EXISTING HYDROLOGIC DATA

IV. EXTERNAL FLOWS: CATCHMENT AREAS, AGRICULTURE, WATER QUALITY

V. RESTORATION OF THE FLOW REGIME IN THE EASTERN BIG CYPRESS

VI. OTHER ISSUES: –

1. Precipitation quality
2. Changes in vegetation along roads and canals downstream of discharge structures
3. Changes in salinity gradients
4. Canals as habitat for exotic species
5. A list of mitigation priorities

REFERENCES CITED:

Fourqurean, J.W.; Jones, R.D.; and Zieman, J.C. (1993)
Processes influencing water column nutrient characteristics and phosphorus limitation of biomass in Florida Bay, Florida, USA: Inferences from spatial distributions *Estuarine, Coastal and Shelf Science* **36**:295-314

Porter, J.M. (1992)
Quantification of loss and change in Floridian reef coral populations *American Zoologist* 32:625-640

Smith, T.J. III; Hudson, J.H.; Robblee, M.B.; Powell, G.V.N.; and Isdale, P.J. (1989)
Freshwater flow from the Everglades to Florida Bay: An historical reconstruction based on fluorescent banding in the coral *Solenastra bournoni*. *Bulletin of Marine Science 44:275-282*

ISSUE DISCUSSION

I. BASELINE HYDROLOGY CHARACTERIZATION: CLIMATE, WATER BUDGET, FLOW ROUTES AND WATER QUALITY

The natural surface water hydrology of Big Cypress National Preserve has not been determined: it is poorly understood in terms of total precipitation, evapo-transpiration, and the relation of discharge to these factors.

A. Baseline Hydrologic Data The only long-term weather and climate stations in the area are at Everglades City and Tamiami Trail-Mile 40 [NOAA], which are both outside the Preserve boundaries. Adequate statistical analysis does not appear to been made on either of these stations, and there is at present no system for sharing this data in a real-time framework. No stations with long-term records exist within Big Cypress National Preserve.

Five rain recorders [two provided by SFWMD] and two temperature sensors exist in Big Cypress National Preserve, but all were recently installed, and the small size of the "network" cannot adequately represent conditions for the Preserve because of the localized and highly variable precipitation patterns. In addition, these stations were designed to be operated for the purposes of fire condition prediction, with no provision for data inclusion in a hydrologic program.

Objectives

Existing climate information should be utilized to characterize the regime of the Big Cypress National Preserve area. Data from stations neighboring Big Cypress National Preserve need to be analyzed, and a system developed for sharing them. A data storage and analysis system needs to be created for currently-collected fire weather data.

SFWMD is currently funding a study in Everglades National Park to determine the density of gages necessary to adequately quantify rainfall in that area: such a study should be extended into the area of Big Cypress National Preserve. It would be efficient to site meteorological instrumentation at each surface or groundwater monitoring station in the Preserve.

B. Baseline Water Quality A small water quality monitoring program (with lab analysis funded by SFWMD) has been operated by Preserve personnel for the past two years. However, water collection is made at only nine stations, on a bi-monthly schedule at best, and some parameters (such as metals) are analyzed only twice a year.

The SFWMD Department of Water Resource Evaluation maintains a large, regular monitoring program south of Lake Okeechobee and into Everglades National Park. The program also responds to major hydrologic events such as storms, hurricanes, etc.

Objectives
A Preserve-wide water resource database should be developed. Existing water quality for Water Conservation Area 3A (WCA 3A), L-28 Lateral, the Miccosukee lands and others should be accessed and analyzed.

C. Original Flow Patterns Discharge routes in Big Cypress National Preserve have been altered since the 1920's by the construction of numerous canals, roads, borrow pits, etc. No definitive work exists even now that outlines present flow routes. Quantitative modelling of Big Cypress National Preserve hydrology will be hampered until this problem is addressed; while it may not be possible to make a quantitative determination of original flow patterns, qualitative information may be available from longtime residents in the area.

Objectives
The collection of oral histories from longtime residents, concerning the hydrology of the area (water levels, areas of flooding, etc.), should be initiated. Aerial photographs that date from the 1940's, and the results of a 1954 Soil Conservation Service Soil Survey of the Preserve should be acquired and examined for clues to historic hydrology and changes. Notes also exist from local area surveys of roads, canals, and legal boundaries, that could provide clues for indicators of historic volumes, directions and timing of flow.

II. GROUNDWATER DISCHARGE and QUALITY, and SUBSURFACE GEOLOGY

Knowledge of groundwater in the Preserve is practically non-existent. Major studies have been conducted east and west of Big Cypress National Preserve (e.g. SFWMD, 1986 in western Collier County) but not in the Preserve. These findings cannot be reliably extrapolated into Big Cypress National Preserve, yet it is clear that the Surficial Aquifer groundwater flow and surface waters are intimately linked in the Big Cypress. There is also reason to consider that the karst environment of Big Cypress National Preserve provides some connection to the Lower Tamiami Aquifer, which is less than 50 feet below the surface in much of the Preserve.

Slightly more information exists of the subsurface geology of Big Cypress National Preserve, but this is nearly all derived from cuttings, rather than cores. The information sought in the drilling of these wells was for the purpose of oil and gas extraction--near-surface information was considered peripheral to their purpose, and they tend to be concentrated in the north, over the petrochemical trend. This lack of knowledge of geologic structure and stratigraphy greatly inhibits any understanding of groundwater conditions and movements.

Objectives

Initial steps to remedy the absence of adequate geologic and geohydrologic knowledge in the Preserve must start with the installation of a groundwater monitoring network. This should likely include at least four transects, with 3 well clusters each: north-south along the Turner River Road and the Florida Trail, andeast-west along I-75 and Highway 41. Installation and monitoring would be coordinated between Big Cypress National Preserve, SFWMD and USGS.

The information gained from the wells would also be used to construct fence diagrams of the subsurface geology.

III. ANALYSIS OF EXISTING HYDROLOGIC DATA

Water quality and stage data have been collected in cooperation with SFWMD for several years. Because of initial insufficient training and a shortage of personnel (Big Cypress National Preserve has had a staff hydrologist only since January, 1993), there is a backlog of stage recorder charts that have not been compiled, and no adequate method of sharing data between SFWMD and Big Cypress National Preserve.

The remoteness of most of the Big Cypress National Preserve sites requires visitation by helicopter, creating maintenance problems, and an inability to predict flows in a timely manner. Currently, it is planned to upgrade the stage recorders from charts to data loggers over a two-year period, but the instruments still have to be visited on a regular basis by helicopter.

Given the large area involved, the density of the existing network is also insufficient to adequately characterize flows within and from the Preserve.

Objectives

Realistically, the early, most-complicated backlogged charts will not be possible to do in any prompt time-frame at Big Cypress National Preserve. SFWMD personnel who continually work with A-71 charts and have the necessary software and hardware could likely resolve this issue quickly and easily, and make the collected data usable, to the benefit of both Big Cypress National Preserve and SFWMD.

Big Cypress National Preserve will be able to maintain what is now routine computation and entry of daily stage means until the entire monitoring network is upgraded to a low-maintenance situation more reflective of our personnel realities.

An evaluation of the network adequacy and density should be made under the same criteria governing the placement of these stations elsewhere in the SFWMD and Everglades National Park.

IV. EXTERNAL FLOWS: CATCHMENT AREAS, AGRICULTURE, WATER QUALITY

The hydrology of the original Preserve appeared relatively self-contained, but the enlargement of Big Cypress National Preserve in 1988 with the Addition lands has complicated the overall water discharge and quality status. Firstly, surface flows into and through the Big Cypress National Preserve Addition lands are not well understood, and secondly, because Addition lands now have the effect of making Big Cypress National Preserve an upstream user of a large portion of the flow that ultimately enters Everglades National Park and the Shark valley Slough system.

Most of the flow into the Addition area exits to WCA 3a, but it is not certain whether water once flowed to most or all of the rest of Big Cypress National Preserve from the Addition. Current topographic information is not accurate enough to make such a determination with any certainty. If water does regularly flow from Mullet Slough to the rest of Big Cypress National Preserve, then all of the Preserve could be affected by agricultural and other land use changes north of the Preserve. Lastly, the extent or the occurrence of groundwater flow is unknown.

Activities on lands outside of the Preserve probably affect the volume, timing and quality of water flow into the Preserve. Surface waters definitely flow into the Preserve from lands that are adjacent to Okaloacoochee Slough and Mullet Slough, and from Everglades National Park in Big Cypress National Preserve's southeastern corner.

Agricultural development along the northern Preserve boundary is also increasing. Elsewhere in south Florida it has been found that agriculture can cause a variety of impacts to water resources, e.g. lowering water tables in the wet season, raising water tables in the dry season, and contributing pesticide and nutrient runoff. Effects to the water table can extend 100 to 10,000 feet laterally. If it becomes necessary to obtain more water from Conservation Area 3a or Mullet Slough in order to restore natural flows, however, the quality of these waters needs to be determined before they are delivered to eastern Big Cypress National Preserve.

Objectives

The variety of actions programs needed to assess these questions could include the following:

1. Accurate topographic mapping of Big Cypress National Preserve, in particular the southern margin of Mullet Slough and the eastern boundary of the Preserve. The mapping should extend to adjacent lands to understand surface flow patterns into and out of the Preserve.

2. Determine through observation, mapping, tracers or other means, whether significant water moves from Mullet Slough to the rest of Big Cypress National Preserve.

3. Expand the water quality monitoring program, and archive relevant areal water quality information from SFWMD and Environmental Protection Agency in one place.

4. Examine historic and current land uses north of Big Cypress National Preserve in order to identify trends and the probable nature of impacts. Investigate the impacts of external land uses on the quantity and quality of surface and groundwater flows to the Preserve, e.g. by investigating citrus pumping impacts on Mullet Slough.

V. RESTORATION OF THE FLOW REGIME IN THE EASTERN BIG CYPRESS

A substantial portion of Big Cypress contributes flow to, and receives flow from, the Everglades marsh system. It has therefore also been significantly impacted by the roads, canals, etc. constructed southward from Lake Okeechobee in recent decades, to the detriment of historic discharge timing, durations, and amounts.

Relatively recently, two other major changes have occurred: inflows from the north have likely declined because backpumping of agricultural water into Lake Okeechobee is no longer permitted, and water that formerly flowed overland to southeastern Big Cypress National Preserve has been interrupted by construction of the L-28 and L-29 levee complexes, and impounded in Conservation Area 3A.

Levee 29 (paralleling US 41 east-west) is the major obstruction for flow southward from Lake Okeechobee into Shark Valley Slough (the central portion of Everglades National Park, and eastern area of Big Cypress National Preserve). Pumping, and manipulation of release scheduling using WCA 3A as a reservoir, has attempted to restore original conditions of flow volumes and timing to Shark Valley to ameliorate the effect of L-29.

Westward, this levee merges into Levee 28. L-28 extends 18 miles north from US 41, as the eastern edge of Big Cypress; Conservation Area 3A lies to the east. L-28 was constructed in the 1960's to control floods and to protect the Jetport site, and creates an artificial boundary between the Big Cypress National Preserve and Everglades drainage systems.

Water that would flow west from Conservation Area 3A in Big Cypress National Preserve is held back by the levee, except for periodic releases through the S-343 culverts, and in extreme high water conditions when recently-cut "crossover culverts" become operational. Outflows from the S-343 culverts and from the S-12's are periodic and unplanned: the timing, duration, and volume of water deliveries to southeastern Big Cypress National Preserve have been inappropriate, and in no way recreate natural flow patterns and hydrologic regimes of SE Big Cypress National Preserve.

Flow regime modifications of Everglades National Park discharge cannot be disconnected hydrologically from changes in Big Cypress National Preserve, because they share the same levee system and same water reservoir (WCA 3A). The original, natural hydrologic regime of Shark Valley, and the sloughs to its west (Stairsteps) in Big Cypress National Preserve, were interconnected.

There is a finite amount of water available from Water Conservation Areas 3a and 3b. Releases from WCA 3A have been largely driven by consideration of discharge to the Shark Valley Slough in Everglades National Park, to the detriment of the natural system of Big Cypress National Preserve. The outflow that does occur into Big Cypress National Preserve through the L-28 culverts and Structure

343 (at the southern end) occurs as a by-product of US Army Corps of Engineers (USACOE) releases scheduled to simulate natural flows into Shark Valley Slough, rather than as planned additions to Big Cypress National Preserve flow.

This history of operation of the WCA, is of great concern to the Preserve, *in particular* the possibility that water which had previously been delivered to southeast Big Cypress National Preserve (and maintained Lostmans, Dixons and East Sloughs) might instead be released much further east to rewater East Everglades.

Objectives

1. Realistic, long-term solutions to the problems of water distribution in South Florida require that the major hydrological resources and needs of Big Cypress National Preserve be included in regional planning and operation. Recognition is needed that Big Cypress National Preserve needs must be considered in the water budget of both the Lower East Coast Management Plan **and** the Lower West Coast Management Plan. Within the operation of the Lower East Coast Management Plan, there must be coordination among the SFWMD, Everglades National Park, USACOE and Big Cypress National Preserve.

For example, development and operation of the "Natural Systems Model" should include data from Big Cypress National Preserve; the timing and evaluation of experimental deliveries and permanent changes of operation, and future releases from, or modification of, L-29, L-28, and S-343 A & B, and S-12 should operate as part of a hydrologic program inclusive of both Shark Valley (Everglades National Park) and Stairstep (Big Cypress National Preserve) needs.

2. Quantitative analysis of existing historical flow information can be used to help characterize some of the changes that operation of control structures can effect on flow releases, and evaluate the role of water deliveries from the WCA to Big Cypress National Preserve: e.g. flow-section data for USGS stage-recorders on US 41 and southeastern Big Cypress National Preserve should be evaluated in conjunction with WMD discharge and pumping histories, to quantify the hydrologic interrelation of Shark Valley and the Stairstep area [Lostman's, Gum, and East Sloughs], and to determine how the L-28 Tieback is altering flows into Big Cypress National Preserve and how these impacts can be mitigated.

3. A surface and groundwater hydrologic monitoring system of common instrumentation and density of coverage should be developed among SFWMD, Big Cypress National Preserve, and Everglades National Park. It should include integrated database management, and standardized analyses and would likely be best coordinated by SFWMD assistance to support planning. Water-quality monitoring of all discharges from Area 3A should be included.

4. The need for experimental deliveries should be evaluated immediately, and transitional delivery schedules for S-343 A & B should be developed, implemented and monitored. These should be implemented with concurrent monitoring by SFWMD and US ACOE.
5. Accurate topographic surveys should be extended into Big Cypress National Preserve from Everglades National Park and WCA 3A to aid in hydrologic modelling.

VI. OTHER ISSUES of MUTUAL SFWMD-BCNP INTEREST:

PRECIPITATION QUALITY

The quality of wet and dry deposition, and its impacts to Preserve waters has not been evaluated. The Preserve has a NADP precipitation monitoring station that will provide data, but this one site may be insufficient.

CHANGES IN VEGETATION ALONG ROADS, CANALS, DOWNSTREAM OF STRUCTURES, AND EXTERNAL IMPACTS-

Some obvious vegetation changes have occurred immediately adjacent to roads and canals, but there has been no investigation of possible changes further away from disturbances. Increased agricultural developments north of Big Cypress National Preserve could impact water quality and groundwater, and subsequently, vegetation in the near future.

CHANGES IN SALINITY GRADIENTS

Anecdotal and descriptive information of long-term residents in the Preserve indicates significant changes in the flow regime where waters from Big Cypress National Preserve empty into the mangrove swamps in Everglades National Park. Possible causes are reduced flows from the Big Cypress National Preserve and Everglades National Park watersheds and/or sea level rise. Channels that were once historically open where the major sloughs empty to the bays, have become choked with mangroves.

CANALS AS HABITAT FOR EXOTIC SPECIES

Exotic species such as hyacinth and cichlids are known to have large populations in the canals in the Preserve. These may be providing pathways for spreading infestations through the Preserve.

ESTABLISH A LIST OF MITIGATION PRIORITIES

The Preserve should have a list to identify several wetlands mitigation projects that can be offered to those needing mitigation for wetlands impacts outside the Preserve.

South Florida Water Management District

3301 Gun Club Road • P.O. Box 24680 • West Palm Beach, FL 33416-4680 • (407) 686-8800 • FL WATS 1-800-432-2045

RES 16-14-03

May 18, 1993

Tom Miller, Ph.D.
Hydrologist
Big Cypress National Preserve
HCR 61, Box 110
Ochopee, FL 33943

Dear Dr. Miller:

Last month Mr. David Swift, a member of the District's Planning Department had the opportunity to contact your office with regard to compiling information needed for future water resource planning efforts within the Lower East Coast (LEC) Planning Region of Florida. As you know, the LEC Planning Area includes Lake Okeechobee, the Everglades Agricultural Area, Lower East Coast Urban Areas, the Western Basins, the Water Conservation Areas, Everglades National Park, and a portion of the Big Cypress National Preserve (BCNP). The District would appreciate your agency's help in obtaining the information listed below to assist the District in its long-range planning efforts.

1. Identification of existing hydrologic/environmental issues within the BCNP. The District would be interested in receiving comments from the BCNP staff on all areas of LEC Planning Region; however, your primary responsibility would be defining existing hydrologic/environmental issues within the BCNP and adjacent lands.

2. Identify (list) existing priority areas within lands under jurisdiction of the BCNP which are in need of hydrologic restoration (i.e., list areas that need more or less water, better timing or distribution of water or hydroperiod improvements).

3. If known, identify specific hydrological objectives for maintaining or restoring these priority areas.

4. Identify what operational, structural or other improvements your agency would recommend to implement restoration of the priority areas identified above as well as probable time frames for implementation of these programs.

   The District recognizes that some of this information is yet to be developed for some areas of the Everglades. In these cases, please list the data requirements or additional research that needs to be undertaken to develop a strategy for restoring these areas.

5. Identify and list ongoing environmental restoration programs designed to improve hydrological conditions within the BCNP. If known, identify the time frames associated with the implementation of these programs.

ViroGroup
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TECHNOLOGY

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Phone 813-574-1919
FAX 813-574-8106

July 29, 1993

Planning Department,
South Florida Water Management District
3301, Gun Club Road,
West Palm Beach, FL 33416-4680

ATTENTION JAMES T. GROSS

Dear Mr. Gross:

Please find enclosed a diskette containing the MODFLOW BCF2, STR1, and PCG2 packages.

BCF2 allows re-wetting of dry cells and is documented in USGS Open-File Report 91-536, "A Method of Converting No-Flow Cells to Variable-Head Cells for the U.S. Geological Survey Modular Finite-Difference Ground-Water Flow Model" by M.G. McDonald, A.W. Harbaugh, B.R. Orr, and D.J. Ackerman.

We have found the PCG2 solver much more efficient and faster than either SOR or SIP on our PC-computers. I am not sure what improvement you will get on the workstations but we had significant improvement in speed, accuracy and convergence. The PCG2 solver is documented in USGS Open-File Report 90-4048, "Preconditioned Conjugate-Gradient 2 (PCG2), a Computer Program for Solving Ground-Water Flow Equations" by M.C. Hill.

STR1 is a simple stream routing package for MODFLOW which I found interesting and think you might like to add to your library. It is documented in USGS Open-File Report 88-729, "Documentation of a Computer Program to Simulate Stream-Aquifer Relations Using a Modular, Finite-Difference, Ground-Water Flow Model" by D.E. Prudic.

You may have some of these reports in your library or need to order them. I could make you a copy of instruction pages from our copies should you have an immediate need.

Sincerely,

Akin Owosina

Akin Owosina